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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,377	11/15/2001	Klaus Golbig	CELL0018	4460

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EXAMINER

HANDY, DWAYNE K

ART UNIT PAPER NUMBER

1743

DATE MAILED: 07/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/991,377

Applicant(s)

GOLBIG ET AL.

Examiner

Dwayne K Handy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-110 is/are pending in the application.
- 4a) Of the above claim(s) 100-110 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 62-75 is/are allowed.
- 6) ☒ Claim(s) 1,3,7,13-61,76-82 and 94 is/are rejected.
- 7) ☒ Claim(s) 2,4-6,8-12,83-93 and 95-99 is/are objected to.
- 8) ☒ Claim(s) 1-110 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>12/10/02, 3/28/03</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-99, drawn to a stacked plate reactor, classified in class 422, subclass 130.
- II. Claims 100-109, drawn to a method of making a stacked flow reactor, classified in class 156, subclass 123.
- III. Claim 110, drawn to a method for performing a chemical reaction, classified in class 436, subclass 174.

2. The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed may be made by another materially different process such as etching.

Inventions III and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP §

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806.05(e)). In this case the apparatus can be used as a catalytic converter for the conversion of waste material to useful or non-harmful products.

Because all three of these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

3. During a telephone conversation with Mr. Mike King on 6/23/04 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-99. Affirmation of this election must be made by applicant in replying to this Office action. Claim 100-110 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 13-61 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "a means for enhancing at least one of....a quality of a chemical product that is produced by said stacked plate reactor" in claim 13 is a relative term which renders the claim indefinite. The term "quality of a chemical product" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear to the Examiner what would be needed to meet the limitation of "enhancing the quality of a chemical product" since "quality" is a relative term. For example, enhanced quality with respect to what? The starting products? Known products from a given reaction? What defines an enhanced quality of a chemical product?

Double Patenting

5. Claims 1, 3, 7, 13, 15-17, 32, 33, 76-78, and 80-82 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 3, 4, and 20-21 of U.S. Patent No. 6,537,506. ('506) Although the conflicting claims are not identical, they are not patentably distinct from each other. In claim 1 of the instant application, applicant has claimed a stacked plate reactor comprised of a plurality of simple plates having at least one opening therethrough and overlapping at least one other opening in an adjacent simple plate as well as 3 fluid paths, a heat

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exchanger, and a means for manipulating flow in the reactor. Claim 20 of the patented claims a stack of simple plates with at least three plates – two outer plates and one intermediate plate forming a reaction chamber in fluid communication with each inlet opening of the outer plates. The outer plates have the two inlet openings as well as additional openings for two heat exchangers which provide heat exchanger fluids. Claim 20 also includes an interdigital mixer in the intermediate plates that is used to form a plurality of individual fluid paths joined in a laminar flow pathway to provide a stacked laminar flow of two reactants. The Examiner believes the features of claim 20 in the ('506) patent anticipates claims 1, 3, 7, 13, 17, 32, 33, 76-78, of the instant claims with the interdigital mixer providing the means for manipulating flow. Claims 3 and 17 state that the means for manipulating flow comprises means for providing internal parallelization of fluid flow. The Examiner believes two reactants flowing in stacked laminar flows claimed in claim 20 of ('506) meet this limitation. This would also equalize residence time (instant claim 7) of the two reactants in the reactor since they are in parallel flow as well as enhance the quality of the produced product since laminar flow would allow for diffusion mixing (instant claim 80) for reacting the streams.

Claims 15 and 16 specify materials of construction that were presented in claims 3 and 4 in the patented claims. It would have been obvious to one of ordinary skill in the art to combine the use of steel from claim 3 ('506) with claim 20 of the patented claims ('506) to obtain the device claimed in claims 15 and 16 of the instant claims. One would make the plates from steel to provide an inert material that would not react with the materials in the reactor.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 3, 13, 15-17, 31, 32, 34, 76, 79-82 and 94 are rejected under 35 U.S.C. 102(b) as being anticipated by Giddings (4,894,146). Giddings teaches an apparatus formed from a stack of simple plates. The device is best shown in Figures 6 and 7 and includes 3 inlets (25, 26, 32) and 3 outlets (22, 23, 31). Fluid samples are introduced through the inlets to form a stacked laminar flow streams that flow parallel to each other. The laminar flow stream is formed due to the presence of a thin enclosed channel which has a thickness which is very thin compared to the other two dimension of the channel. The Examiner considers this choice of dimensions to be a means for manipulating the fluid flow to achieve a desired result – a stacked laminar stream. In this stacked laminar stream, mixing and reaction is achieved through diffusion between the two streams. As for the heat exchanger element, inlet (32) would allow for the introduction of a heated fluid which would provide a heat exchange feature within the device. This would also provide an entry for the heat exchange fluid that is substantially orthogonal to the flow in the fluid channels (instant claims 33 and 79). Giddings recites the use of stainless steel for the plates in column 13, lines 36-38. The Examiner

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believes two reactants flowing in stacked laminar flow meets the limitation of equalizing residence time (instant claim 34) of the two reactants in the reactor since they are in parallel flow.

Allowable Subject Matter

8. Claims 62-75 are allowed.
9. The following is a statement of reasons for the indication of allowable subject matter. In claim 62 applicant has claimed a simple plate chemical reactor comprised of a first outer simple plate comprised of two fluid inlets and two fluid outlets, a plurality of internal simple plates defining a plurality of serially connected reaction units in fluid communication with the first outer plate, and a second outer plate disposed such that the plurality of simple internal plates are stacked between the first and second outer plates. The reaction units formed by the simple inner plates are formed from simple plates that have at least one opening extending therethrough and overlapping with the other internal plates to form a plurality of heat exchangers, at least one mixing and reaction chamber, *and at least one bypass fluid path such that a portion of each reactant is diverted from the at least one mixing and reaction chamber.* The Examiner did not find prior art which taught or suggested this combination of features. Claim 63 includes the features of claim 62 but also includes the additional features of a product collection path and a product bypass path.

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10. Claims 2, 4-6, 8-12, 83-93 and 95-99 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 4 and 95 include the feature of a bypass fluid path for the reactants. Claim 8 and 83 cite the feature of a bifurcated opening as a means for equalizing residence time of the reactants in the reactor. Claim 93 cites the feature of openings of different length in the simple plate as a means for enhancing flow in the reactor.

Conclusion


11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwayne K Handy whose telephone number is (571)-272-1259. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DKH
June 27, 2004


Jill Warden
Supervisory Patent Examiner
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